

Listing of Claims

This listing of claims will replace all prior versions and listings of claims in the Application for patent.

1-24 (Canceled)

25. (Previously Presented) A fiber cement composite building material incorporating a cementitious matrix and cellulose fibers, wherein at least a portion of the cellulose fibers are pretreated prior to incorporating with an elevated temperature washing process to reduce COD content of the cellulose fibers to less than 4.5 kg/ton, wherein the elevated temperature is between about 65 degrees Centigrade to about 120 degrees Centigrade, wherein the COD content of the cellulose fibers is measurable from a filtrate prior to being combined to form the composite building material, wherein the reduced COD cellulose fibers comprise about 2% to 20% by weight, and wherein the reduced COD cellulose fibers add strength reinforcement to the fiber cement composite building material and wherein the fiber cement composite building material is autoclaved.

26. (Canceled)

27. (Canceled)

28. (Previously Presented) The composite building material of Claim 25, wherein the cellulose fibers are cellulose fibers made from cellulose pulps of lignocellulosic materials by a pulping process.

29. (Original) The composite building material of Claim 25, further comprising an aggregate.

30. (Original) The composite building material of Claim 29, wherein the aggregate is ground silica.

31. (Original) The composite building material of Claim 25, further comprising one or more density modifiers.

32. (Original) The composite building material of Claim 25, further comprising one or more additives.

33. (Previously Presented) A material formulation used to form a fiber cement composite building material, comprising:

- a cementitious binder;
- an aggregate;
- one or more density modifiers;
- one or more additives; and

cellulose fibers, wherein at least a portion of the fibers are pretreated prior to incorporating into the formulation with an elevated temperature washing process to reduce COD content of the cellulose fibers to less than 4.5 kg/ton of oven dried pulp, wherein the elevated temperature is between about 65 degrees Centigrade to about 120 degrees Centigrade, wherein the COD content of the cellulose fibers is measurable from a filtrate prior to being combined to form the fiber cement composite building material, and wherein the reduced COD cellulose fibers comprise about 2% to 20% of the formulation by weight and wherein the fiber cement composite building material is autoclaved.

34. (Original) The formulation of Claim 33, wherein the cementitious binder is selected from the group consisting of Portland cement, high alumina cement, lime, high phosphate cement, and ground granulated blast furnace slag cement, and mixtures thereof.

35. (Original) The formulation of Claim 33, wherein the aggregate is selected from the group consisting of ground silica, amorphous silica, micro silica, diatomaceous earth, coal combustion fly and bottom ashes, rice hull ash, blast furnace slag, granulated slag, steel slag, mineral oxides, mineral hydroxides, clays, magnesite or dolomite, metal oxides and hydroxides, and polymeric beads, and mixtures thereof.

36. (Original) The formulation of Claim 33, wherein the density modifier is selected from the group consisting of plastic materials, expanded polystyrene, glass and ceramic materials, calcium silicate hydrates, microspheres and volcano ashes including perlite, pumice, shirasu basalt, and zeolites in expanded forms, and mixtures thereof.

37. (Original) The formulation of Claim 33, further comprising additional fibers selected from the group consisting of natural inorganic fibers, synthetic polymer fibers, regular cellulose fibers and mixtures thereof.

38. (Previously Presented) The formulation of Claim 33, wherein the reduced COD fibers are fibrillated to the freeness of about 150 to 750 degrees of Canadian Standard Freeness.

39. (Canceled)

40. (Original) The formulation of Claim 33, comprising about 10%-80% cement by weight.

41. (Original) The formulation of Claim 33, comprising about 20%-80% silica by weight.

42. (Original) The formulation of Claim 33, comprising about 0%-50% lightweight density modifiers by weight.

43. (Original) The formulation of Claim 33, comprising about 0%-10% additives by weight.

44. (Previously Presented) The formulation of Claim 33, wherein the reduced COD fibers improve the modulus of rupture of the fiber cement composite building material by more than about 10%, compared to a fiber cement composite building material made with an equivalent formulation containing fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

45. (Previously Presented) The formulation of Claim 33, wherein the reduced COD fibers improve the modulus of elasticity of the fiber cement composite building material by more than about 10%, compared to a fiber cement composite building material made with an equivalent formulation containing fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

46. (Previously Presented) The formulation of Claim 33, wherein the reduced COD fibers improve the ultimate strain of the fiber cement composite building material by more than about 10%, compared to a fiber cement composite building material made with an equivalent formulation containing fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

47. (Previously Presented) The formulation of Claim 33, wherein the reduced COD fibers reduce the amount of COD released to process water by more than about 10% in the manufacture of the fiber cement composite building material, compared to a fiber cement composite building material made with an equivalent formulation containing fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

48. (Previously Presented) The formulation of Claim 33, wherein the reduced COD fibers improve the toughness physical and mechanical properties of the fiber cement composite building material, compared to a fiber cement composite building material made with an equivalent formulation containing a fiber with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

49-73. (Canceled)

74. (Previously Presented) A composite building material formulation that comprises a cementitious matrix incorporating reinforcing fibers, wherein at least a portion of the fibers are cellulose fibers having a COD content of less than about 4.5 kg/ton of oven dried pulp, and wherein the composite building material is manufactured by the method comprising:

preparing cellulose fibers to have a COD content of less than about 4.5 kg/ton of oven dried pulp;

mixing the low COD cellulose fibers with the cementitious matrix and other ingredients to form a fiber cement mixture;

forming the fiber cement mixture into a fiber cement article of a pre-selected shape and size; and

curing the fiber cement article so as to form the fiber reinforced composite building material.

75. (Previously Presented) The method of Claim 74, further comprising adding additional fibers into the formulation wherein the additional fibers are selected from the group consisting of natural inorganic fibers, synthetic polymer fibers, regular cellulose fibers and mixtures thereof.

76. (Previously Presented) A material formulation used to form a composite building material, comprising:

a cementitious binder in a range of about 10%-80% by weight, wherein the cementitious binder is selected from the group consisting of Portland cement, high alumina cement, lime, high phosphate cement, and ground granulated blast furnace slag cement, and mixtures thereof;

an aggregate in a range of about 20%-80% by weight, wherein the aggregate is selected from the group consisting of ground silica, amorphous silica, micro silica, diatomaceous earth, coal combustion fly and bottom ashes, rice hull ash, blast furnace slag, granulated slag, steel slag, mineral oxides, mineral hydroxides, clays, magnasite or dolomite, metal oxides and hydroxides, and polymeric beads, and mixtures thereof;

one or more density modifiers in a range of 0%-50% by weight, wherein the density modifier is selected from the group consisting of plastic materials, expanded polystyrene, glass and ceramic materials, calcium silicate hydrates, microspheres and volcano ashes including perlite, pumice, shirasu basalt, and zeolites in expanded forms, and mixtures thereof;

one or more additives in a range of about 0%-10% additives; and

cellulose fibers, wherein at least a portion of the fibers are pretreated prior to incorporating into the formulation with an elevated temperature washing process to reduce COD content to less than 4.5 kg/ton of oven dried pulp, wherein the elevated temperature is between about 65 degrees Centigrade to about 120 degrees Centigrade, wherein the COD content of the cellulose fibers is measurable from a filtrate prior to being combined to form the composite building material, wherein the reduced COD fibers are fibrillated to the freeness of about 150 to 750 degrees of Canadian Standard Freeness, wherein the reduced COD cellulose fibers comprise about 2% to 20% of the formulation by weight; and

wherein the formed composite building material is autoclaved.